Revista de Psicología del Deporte. 2017, Vol 26, Suppl 1, pp. 149-154
Journal of Sport Psychology 2017, Vol 26, Suppl 1, pp. 149-154
ISSN: 1132-239X
ISSNe: 1988-5636

Universidad de Almería
Universitat Autònoma de Barcelona

Impact of intellectual impairment on basketball performance through coaches and referees´ opinion: a qualitative approach

Ignacio Polo*, Javier Pérez-Tejero*, Javier Pinilla* and Javier Coterón*

IMPACT OF INTELLECTUAL IMPAIRMENT ON BASKETBALL PERFORMANCE THROUGH COACHES AND REFEREES´ OPINION: A QUALITATIVE APPROACH

KEYWORDS: Paralympic Sport, Eligibility Systems, Classification.

ABSTRACT: Basketball for players with intellectual impairment (II) is not included as a Paralympic modality due to the lack of evidence based eligibility systems to ensure that only athletes with significant limitations performing basketball participate in II-competitions. Eligibility systems in II-basketball are under development but is necessary to investigate the impact of the impairment in basketball. The aim of this study was to know the point of view of II- coaches and referees about the limitations of their players and the components that should be considered as eligibility criteria. Qualitative method was used in our research. For that 5 open questions were elaborated based on the components of the game identified in the literature. 47 coaches and 6 referees were interviewed through an online survey. The findings of this study indicated that tactical aspects was the component in which II-players present more limitations and should discriminate between eligible and no eligible players followed by technical skills, emotional aspects and cognitive aspects. Physical and motor skills were not considered as limitation but specific positions and roles during the game could be influenced by these components. These results as well as other similar studies that show the opinion of coaches and referees should be taken into consideration to orientate future research to develop evidence-base eligibility systems in this sport.

Basketball for players with intellectual impairment (II) is one of the most practiced team sports in this population at high level competition (INAS, 2015), however is not included yet in the Paralympic program. Although II-basketball took part in the Sydney 2000 Paralympics, in these competitions it was detected that some players did not present any impairment. Due to these serious difficulties found in determining the eligibility of II-athletes, II-sports were suspended from the Paralympic program (Burns, 2015). In 2007, the International Paralympic Committee (IPC) endorsed a new classification system for all para-sports included in the Paralympic program to ensure equity by minimizing the role that impairment plays on final outcome during competition (Tweedy, 2002). According to this new system, the International Association of Sport for para-athletes with intellectual disability (INAS) and IPC worked together establishing a multidisciplinary research project to develop eligibility systems for II- sports in order to re-include them in the Paralympic Program (Van Biesen, Mactavish, Pattyn and Vanlandewijck, 2012). As a result from this project, eligibility systems were developed for II-athletes in table-tennis, swimming and athletics. Consequently, these sports were re-included in London 2012 Paralympic Games with the participation of 118 II-athletes.

Eligibility systems for II-basketball are under development (Pérez-Tejero, Pinilla and Vanlandewijck, 2015; Pinilla et al., 2016) but it is necessary to investigate the impact of intellectual impairment on basketball performance (Tweedy and Vanlandewijck, 2011). Guidetti, Franciosi, Emerenziani, Gallotta and Baldari, (2007) observed that the degree of II (based on IQ test scores) correlated positively with the development of four basketball skills: ball handling, reception, passing and shooting. According to this study, it seems that II might have a negative influence on technical development. A recent study compared the differences to solve specific game situations between elite basketball II-players and amateur able-bodied (AB) players. Results showed that II-players used more time to decide and to execute each game situation than AB-players and they solved fewer situations successfully. Also, II-players committed more rules infractions and used more dribbles (Pinilla et al., 2016). Based on this study, II might also influence negatively on decision making capacity or to carry out activities related with tactical aspects.

Pérez-Tejero et al. (2015) analyzed game-related statistics from elite II-basketball players during competitions (Ankara World Championships 2013) and results pointed out that II-players seemed to present lower shooting efficiency to make more turnovers and less assists compared with AB-players based on the results from other studies in the literature. In line with this study, Pinilla, Pérez-Tejero, Van Biesen and Vanlandewijck (2015) also found that II-players presented higher performance variability during competition, meaning this that performance in this population seemed to be more disperse and varied. These studies

Correspondencia: Dr. Javier Pérez Tejero, Facultad de Ciencias de la Actividad Física y del Deporte. Universidad Politécnica de Madrid. C/ Martín Fierro, 7, 28040, Madrid.
E-mail: j.perez@upm.es
*Facultad de Ciencias de la Actividad Física y del Deporte. Universidad Politécnica de Madrid
This project has been subsidized by the Spanish Ministry of Economy, reference number DEP2012-33649.
Fecha de recepción: 1-10-2016. Fecha de aceptación: 31-1-2017

indicated that II-athletes seemed to present limitations to reach performance levels as high as AB-players. However, as these authors indicated, it was needed to investigate which components of basketball performance are more negatively affected by II.

Perception of coaches has contributed to better understand the influence of different variables on basketball players development: technique, tactic, physical performance and psychology during players´ development stage (Nuno, Vaz, Maçãs and Sampaio, 2009), rules adaptation in kids (Vizcaino, Conde, Sáenz-López and Rebollo, 2013), specialization per playing position (Ortega, Salado, Gómez, Palao and Piñar, 2011) and the kind of game systems that should be used training young players (Ortega, Salado and Sainz de Baranda, 2013). Provided that coaches´ opinion can reveal relevant information about the components that might be determinant to perform in basketball, also, the opinion from experienced coaches and referees in II-basketball could contribute to identify how II affects II-players performing basketball.

The aim of this study was to analyze II-basketball coaches and referees´ opinion about the impact of intellectual impairment on basketball performance. This study could contribute to orientate future research in the development of II-basketball systems (Tweedy and Vanlandewijck, 2011) and to re-include this modality in the Paralympic program.

Method

Participants

The sample was composed of 47 II-basketball coaches and 6 II-basketball referees. Coaches were divided into four groups according to the level of competition in which they trained: INAS (International competition), competition, adapted and ability. Coaches from INAS were from different nationalities while coaches from other groups and referees participated in Spanish competitions. Description of the sample (N, age and years experience in II-basketball) that participated in this study is presented in table 1.

Measure

An online survey was designed ad hoc to address the aim of the present study. Five-open questions were included referring to different topics that, based on the existing literature, might explain the influence of II on basketball performance: a) principal differences between II-players and AB-players (Pérez-Tejero et a, 2015); b) difficulty in motor and skills components (Lahtinen, Rintala and Malin, 2007; Van de Vliet et al; 2006), c) aspects influenced by IQ level during the game (Van Biesen et al; 2012; Pérez-Tejero et al., 2015), d) influence by playing position in the game (Dežman, Trninic and Didzar, 2001) and e) aspects that can be considered for determinate eligibility systems (Franciosi et al; 2012; Pérez-Tejero et al., 2015; Pinilla et al., 2016).

To guarantee that questions were appropriate to answer the research question, expert criteria validation was conducted (De Yébenes, Salvanés and Ortells, 2009). To do this, the last version of the questionnaire was sent independently to 6 basketball experts that met all following criteria: to have a PhD related with basketball, to be basketball professor at the University with at least five years of experience, to have the national basketball coach certificate and to have published articles in journals or books related with basketball. Experts were asked to review grammatical questions and the property of the 5 open questions. Basketball experts presented 100% agreement for inclusion of all open questions with no grammatical changes.

Procedure

The survey was administrated the through Surveymonkey on-line application with the collaboration of INAS, the Spanish Federation of Sports for athletes with Intellectual Disability (FEDDI) and the Basketball Federation of Madrid (FBM). Participants were called by e-mail, who participated voluntarily and agreed to use their answers anonymously to address the aim of the present study. Data analysis was conducted using Nvivo 10 and according to inductive category development suggested by Mayring (2000). The meaning units of the answers corresponding to each question were identified, labeled and subsequently first sorted into categories in an inductive process by a researcher. Afterwords, this first grouping was reviewed by a second researcher. In line with recommendations by Miles and Huberman (1994) and Patton (2002), most categories were labeled on existing theoretical concepts and frameworks. New themes emerged were assigned following discussion. Final set of categories was defined by agreement of both researchers.

Results

A total of 377 meaning units were defined and distributed in categories as shown in table 2.

Related with the differences between II and AB-players, 21 of 53 participants admitted that tactical aspects were one of the most differentiating aspects between players (e.g. specific positions in the court, change between offensive and defensive role), followed by adaptive behavior (*Decision making in new situations. Coach 2*). Additionally, coaches expressed that emotional components play an important role in II-players due to the importance of stress management in critical situations in the game. Technical skills were the least relevant aspect coaches´ opinion. Finally, 11 participants explained that differences between II-players and AB-players depend on IQ level of II-players (*Depending on the level of disability of players, the difference could increase or decrease. Coach 16 and 25*).

19 participants did not find any motor difficulty that could affect in basketball skills of II-players. On the other hand, the most frequent codes that could explain the difficulty in motor skills were technical skills (e.g. ball handing, shot execution and lay-up) followed by physical aspects (especially coordination), cognitive aspects and rules understanding. Another obtained result was that the differences in motor skills depending on IQ

	INAS (IN)	Competition (COM)	Adapted (ADP)	Ability (ABL)	Referees (REF)	Total
N	7	18	14	8	6	53
Age	50.1 (10.98)	34.9 (9.86)	33.64 (9)	38.87 (11.8)	30.83 (5.19)	36.72 (10.95)
Experience	18.2 (14.08)	8.28 (7.86)	7.64 (4.8)	7.12 (7.73)	1.83 (0.75)	8.41 (7.9)

Table 1 Sample description

Components	Meaning units		n categories	Categories
	n	*%*		
C1- Differences between II-basketball players and AB- basketball players	107	28.4	10	Cognitive aspects Decision making Motor and skills components IQ level Technical skills Speed game Adaptative behaviour Rules understanding Emotional components Tactical aspects
C2- Difficulty in motor and skills components	84	22.3	5	Motor and skills components IQ level Coordination Technical skills Cognitive aspects
C3- Aspects influenced by level of IQ	57	15.1	7	Motor and skills components Cognitive components Rules understanding Technical skills Tactical aspects Decision making No differences
C4- Aspects influenced by specific position in the game	31	8.2	5	No relationship Total experience Cognitive components Motor skills Physical aspects
C5- Elegibility system	98	26	8	Cognitive components Disability certificate Adaptative behaviour Emotional components Rules understanding Technical skills Tactical aspects Physical and motor skills
Total	377	100%	35	

Table 1 Sample description.

level (*By motor skills greater level of impairment greater problem in learning technical skills and/or physical abilities. Coach 13*).

Regarding the aspects in the game that could be affected by IQ level, 14 participants expressed that technical skills (specially shooting efficiency) and tactic aspects were the components most negatively influenced by IQ level. Finally, 7 participants believed that decision making could be influenced by IQ level. Most of participants believed that skills, attributes and knowledge's level could be influenced by each player's specific position. Moreover 8 participants expressed that physical aspects should be accounted to establish the position on the court (*Basically the specific position is determined by the height. Referee 2*). Finally, specific position can be influenced by total experience of II-players.

In figure 1, number of references obtained related with the aspects during the game that should distinguish between an eligible or non-eligible II-basketball player are presented. It was observed that 17 participants considered that the first step to distinguish between an eligible or non-eligible player is to have an IQ certificated (*Anyone with intellectual impairment can play basketball. Coach 8*). Tactical aspects were the most referenced in this question, highlighting specific position on the court followed by decision making in specific situations and defensive role. Technical skills and emotional aspects with 13 references were another term they considered that should be taken into account on eligibility systems. With regard to technical skills, participants considered shooting skills and ball handling as aspects to consider in eligibility system. To tolerate frustration in stressful situations during the game was the aspect most valued as emotional component. Another interesting result was that coaches believed that II-players must understand and apply the rules of basketball (*Knowing the rules of basketball is fundamental. Coach 23*).

Discussion

This study aimed to analyze II-basketball coaches and referees´ opinion about the impact of intellectual impairment on basketball performance. Results from this study provided relevant information that could orientate future research in the development of II-basketball eligibility systems (Tweedy and Vanlandewijck, 2011).

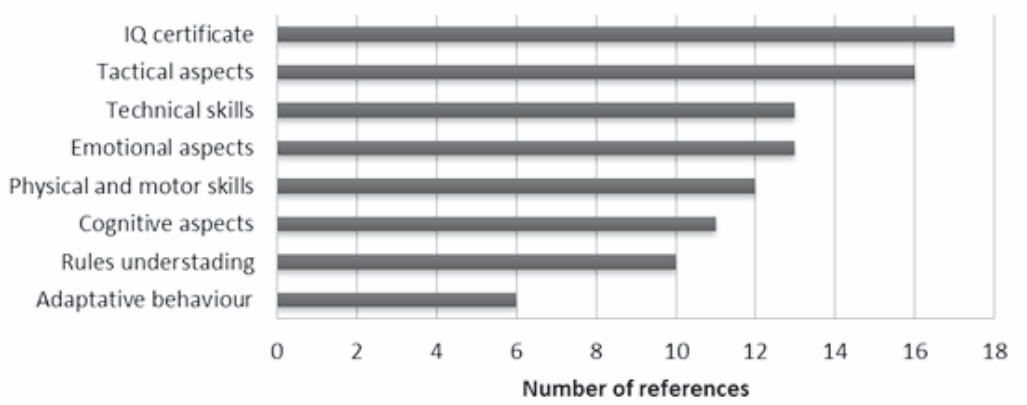

Figure 1 Aspects during the game that should distinguish between an eligible or non-eligible II basketball player in opinion of coaches.

One aspect to analyze was the differences between II-players and AB-players. In this line, Van Biesen, Mactavish and Vanlandewijck (2014) demonstrated that II was associated with a decrease in tactical proficiency in table-tennis. Moreover, previous studies found that the learning process in II-athletes had significantly lower levels compared with AB-athletes (Van Biesen at al., 2012). Most of coaches and referees considered that tactics following by adaptive behavior were the most differentiating aspects between players. A recent study demonstrated that II-basketball players spend significantly ($p \leq 0.05$) more time to decide and execute a solution to solve a basketball game situation than AB-players (Pinilla et al; 2016). Also, II-players made more rule infractions, fakes and dribbles than AB-players. Another interesting result from the present study is stress management. This state of stress can be characterized by the decrease on players´ performance (Navarro Barragán, Gómez Ruano, Lorenzo and Jiménez, 2013).

There is some controversy about motor difficulty of II-players in opinion of coaches and it seems that technical skills and physical aspects are associated in this case. Franciosi, Guidetti, Gallotta, Emerenziani and Baldari (2010) showed that there were significant contributions between ball handling and explosive leg power and upper-body muscular strength. Forearm and upper-body muscular strength and endurance, had a positive contribution to passing. Finally, explosive leg power had a positive contribution to reception and shooting.

With regard to aspects influenced by IQ level, coaches agreed that technical skills and decision making are relevant. According to Burns (2015), II-players might present higher limitations in those activities with higher cognitive demands. That could explain the higher performance variability found between II-players at the same competition when compared with AB-players (Pinilla et al., 2015). Most of participants considered that IQ level of II-players is relevant in performance of basketball and one of the most limited aspects. However, several studies indicated that limitations in II-athletes are due to perceptual and cognitive skills and not in IQ level (Van Biesen, Verellen, Meyer and Vanlandewijck, 2010).

Most of the coaches believed that skills, attributes and knowledge's level could be influenced by each player's specific position. Dežman, Trninic and Dizdar (2001) designed an expert model system to orientate AB-basketball players in particular positions and/or roles in the game. Results showed that decision making system can be an auxiliary instrument on orienting players to the positions and roles in the game. Moreover, the authors found difficult to determinate optimal position for forwards, shooting guards and power forwards due to versatile of these specific positions. Finally, body height was the greatest variable influence on orientation of players to specific positions in the game.

In opinion of coaches and referees, tactical aspects should be considered to distinguish between an eligible or non-eligible II basketball. In this sense, Polo, Pinilla, Pérez-Tejero and Vanlandewijck (2014) showed that II-players presented significantly more limitations in offensive individual tactics than technical skills and defensive individual tactics in opinion of national coaches. Regarding this result, it seems that tactical aspects could be a performance component to be considered in II-basketball eligibility system. Moreover technical skills are another performance component to be considered such shooting, ball handling or passing. Franciosi et al. (2012) proposed a basketball classification test including in 4 basketball abilities: ball handling, reception, passing and shooting. Results from this research showed that all II-players improved scores from the test after a training period of 8 months. The individual level scores also showed significant differences between categories from Italian II-basketball competition groups. Decision making in specific situations during the game is considered important to distinguish between an eligible or non-eligible II-basketball player in opinion of coaches and referees. In this line, Pinilla et al. (2016) compared AB and II-players to capacity to solve eight standardized game situations calculating discriminant function and the canonical correlation obtaining. Results showed that 98.6% of players could be classified correctly.

The findings of this study indicated that tactical aspects is one of the most affected performance component, also it should to be considered as eligibility criteria. Moreover coaches and referees think that IQ certificate is one of the first steps to be considered in II-basketball eligibility system. On the other hand, participants consider that technical skills are not as affected as tactic aspects or emotional components but could distinguish between eligible and non eligible II-basketball player. Coaches and referees' opinion from these findings must be taken into consideration to orientate future research to develop evidence-based eligibility systems in this sport.

IMPACTO DE LA DISCAPACIDAD INTELECTUAL EN EL RENDIMIENTO DEL BALONCESTO A TRAVÉS DE LA OPINIÓN DE ENTRENADORES Y ÁRBITROS: UN ENFOQUE CUALITATIVO

PALABRAS CLAVE: Deporte Paralímpico, sistemas de elegibilidad, clasificación

RESUMEN: El baloncesto para personas con discapacidad intelectual (DI) no está incluido como modalidad paralímpica debido a la falta de sistemas de elegibilidad basados en la evidencia que aseguren que, sólo deportistas con limitaciones significativas para practicar baloncesto participan en competiciones específicas. Los sistemas de elegibilidad en jugadores DI están en desarrollo pero es necesario investigar sobre el impacto de la discapacidad en el baloncesto. El objetivo del presente estudio fue conocer, desde el punto de vista de los entrenadores y árbitros, las limitaciones que sus jugadores DI presentan y aquellos componentes que deberían de ser considerados como criterios de elegibilidad. La metodología utilizada en nuestro estudio es cualitativa. Para ello, cinco preguntas abiertas fueron elaboradas basadas en los componentes del juego identificados en la literatura. 47 entrenadores y 6 árbitros fueron entrevistados a través de una encuesta on-line. Los resultados muestran que los aspectos tácticos fueron aquellos en los que los jugadores presentaban mayores limitaciones y permitían discriminar que un jugador fuese elegible o no; seguido de las habilidades técnicas, aspectos emocionales y aspectos cognitivos. Las habilidades físicas y motoras no se consideraron como una limitación pero podrían estar influenciados por las posiciones y roles específicos durante el juego. Estos resultados, así como otros estudios similares que muestren la opinión de los entrenadores y árbitros, deberían de ser tenidos en cuenta para orientar futuras investigaciones con el fin de desarrollar sistemas de elegibilidad basados en la evidencia de este deporte.

Referencias

Burns, J. (2015). The impact of intellectual disabilities on elite sports performance. *International Review of Sport and Exercise Psychology, 8*(1), 251-267.

De Yébenes M.J.G; Salvanés, F. R. and Ortells, L. C. (2009). *Validation of questionnaires. Reumatología Clínica (English Edition), 5*(4), 171-177.

Dežman, B., Trninic, S. and Dizdar, D. (2001). Expert model of decision-making system for efficient orientation of basketball players to positions and roles in the game - Empirical verification. *Collegium Antropologicum, 25*(1), 141-152.

Franciosi, E., Guidetti, L., Gallotta, M. C., Emerenziani, G. P. and Baldari, C. (2010). Contributions of selected fundamental factors to basketball performance in adult players with mental retardation. *Journal of Strength and Conditioning Research, 24*(8), 2166-2171.

Franciosi, E., Gallotta, M. C., Baldari, C., Emerenziani, G. P. and Guidetti, L. (2012). Basketball ability testing and category for players with mental retardation: 8-month training effect. *Journal of Strength and Conditioning Research, 26*(6), 1524-1531.

Guidetti, L., Franciosi, E., Emerenziani, G. P., Gallotta, M. C. and Baldari, C. (2007). Assessing basketball ability in players with mental retardation. *British Journal of Sports Medicine, 43*(3), 208-212. doi: 10.1136/bjsm.2006.034918

INAS (2015). *INAS Annual reports*. International Federation for Para-athletes with Intellectual Disabilities. [Retrieved on 27th June 2016 from www.inas.org].

Lahtinen, U., Rintala, P. and Malin, A. (2007). Physical Performance of Individuals With Intellectual Disability: A 30-Year Follow-Up. *Adapted Physical Activity Quarterly*, *24*(2), 125-143.

Mayring, P. (2000). Qualitative content analysis. *Forum: Qualitative Social Research, 1*(2), Art. 20. Available at: http://www.qualitative-research.net/fqs-texte/2-00/2-00mayring-e.htm.

Miles, M.B. and Huberman, A.M. (1994). *Qualitative data analysis*. Thousands Oaks, CA: Sage.

Navarro Barragan, R.M; Gómez Ruano, M.A; Lorenzo, J. and Jiménez, S. (2013). Qualitative analysis of critical moments in basketball. *Revista de Psicología del Deporte*, *22*(1), 249-251.

Nuno, L., Vaz, V., Maçãs, V. and Sampaio, J. (2009). Coaches perceived importance of drills items in basketball players' long term development. *Revista de Psicología del Deporte*, 18(3), 457-461.

Ortega, E., Salado, J. and Sainz de Baranda, P. (2013). Opinión de los entrenadores de baloncesto sobre los sistemas de juego en las distintas categorías en etapas de formación. *Kronos*, *11*(2).

Ortega, E., Salado, J., Gómez Ruano, M. A., Palao, J. M. and Piñar, M. I. (2011). Opinión de los entrenadores y expertos de baloncesto sobre la especialización en puestos específicos. *Revista Pedagógica de Educación Física*, 23, 12-16.

Patton, M.Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.

Pérez-Tejero, J., Pinilla, J. and Vanlandewijck, Y. (2015). Perfil del rendimiento en el campeonato del mundo de baloncesto (Ankara 2013) para personas con discapacidad intelectual: Implicaciones en el sistema de elegibilidad. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte, 10*(2), 187-192.

Pinilla, J., Pérez-Tejero, J., Sampedro, J., Refoyo, I., Lorenzo, A., Lorenzo, J. and Vanlandewijck, Y. (2016). Influence of intellectual impairment (II) on basketball players´capacity to solve a game situation: towards evidence-based classification systems in II-basketball. *Psychology, Society & Education, 8*(2), 252-265.

Pinilla, J., Pérez-Tejero, J., Van Biesen, D. and Vanlandewijck, Y. (2015). Performance variability in basketball players with intellectual impairment: Ankara World Championships 2013 analysis. *Revista de Psicología del Deporte, 24*, Suppl 1, 77-83.

Polo, I., Pinilla, J., Pérez-Tejero, J. and Vanlandewijck, Y. (2014). *Coaches' opinion about game difficulties experienced by basketball players with intellectual disability*. Paper presented at the European Congress of Adapted Physical Activity, Madrid.

Tweedy, S. M. (2002). Taxonomic Theory and the ICF: Foundations for a Unified Disability Athletics Classification. *Adapted Physical Activity Quarterly, 19*(2), 220-237.

Tweedy, S. M. and Vanlandewijck, Y. C. (2011). International Paralympic Committee position stand—background and scientific principles of classification in Paralympic sport. *British Journal of Sports Medicine*, *45*(4), 259-269.

Van Biesen, D; Verellen, J; Meyer, C. and Vanlandewijck, Y. (2010). The Ability of Elite Table Tennis Players With Intellectual Disabilities to Adapt Their Service/Return. Adapted physical activity quarterly, 27 (3), 242-257.

Van Biesen, D., Mactavish, J., Pattyn, N. and Vanlandewijck, Y. (2012). Technical proficiency among table tennis players with and without intellectual disabilities. *Human movement science, 31*, 1517-1528.

Van Biesen, D., Mactavish, J. and Vanlandewijck, Y. (2014). Tactical proficiency among table tennis players with and without intellectual disabilities. *European Journal of Sport Science*, *14(05)*, 403-409.

Van de Vliet, P., Rintala, P., Fröjd, K., Verellen, J., Van Houtte, S., Daly, D. J. and Vanlandewijck, Y. C. (2006). Physical fitness profile of elite athletes with intellectual disability. *Scandinavian Journal of Medicine & Science in Sports, 16*(6), 417-425.

Vizcaino, C., Conde, C., Sáenz-López, P. and Rebollo, J. A. (2013). Referees', coaches', and experts' opinions on the utilisation of the rules in the teaching-learning process of mini-basketball. *Revista de Psicología del Deporte, 22*(1), 289-292.